

### Remarks

Entry of this Amendment, reconsideration of the application and allowance of all claims are respectfully requested. Claims 1-8, 11-13 & 16-18 remain pending.

Initially, the Office Action restates the 35 U.S.C. §101 rejection to claims 5-8 & 16-18. In response to this rejection, Applicants have herein amended claims 5-8 & 16-18 to recite that the apparatus is a computer-implemented apparatus. Based on these claim amendments, which are submitted pursuant to the Examiner's comments contained at page 9 of the Office Action requesting that the apparatus be tangibly embodied in a computer, reconsideration and withdrawal of the 35 U.S.C. §101 rejection to claims 5-8 & 16-18 are respectfully requested.

By this paper, independent claims 1, 5, 11 & 16 are amended to more particularly point out and distinctly claim certain aspects of the present invention. These claim amendments are submitted in a *bona fide* attempt to further prosecution of the application. Support for the amended language can be found throughout the application as filed. For example, reference page 24, lines 22-26 of the application. No new matter is added to the application by any amendment presented.

In the Office Action, claims 1-8, 11-13 & 16-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Agesen et al. (U.S. Patent No. 6,173,642; hereinafter Agesen). This rejection is respectfully, but most strenuously, traversed to any extent deemed applicable to the claims submitted herewith and reconsideration thereof is requested.

An "obviousness" determination requires an evaluation of whether the prior art taken as a whole would suggest the claimed invention taken as a whole to one of ordinary skill in the art. In evaluating claimed subject matter as a whole, the Federal Circuit has expressly mandated that functional claim language be considered in evaluating a claim relative to the prior art. Applicants respectfully submit that the application of these standards to the independent claims presented (i.e., claims 1, 5, 14 & 16) leads to the conclusion that the recited subject matter would not have been obvious to one of ordinary skill in the art based on the applied patent.

Specifically, Applicants request reconsideration and withdrawal of the obviousness rejection on the following grounds: (1) the Office Action misinterprets the teachings of the Agesen patent, thus voiding the basis for the rejection; (2) the Agesen patent itself lacks any teaching, suggestion or incentive for its further modification as necessary to achieve Applicants' recited invention; and (3) the characterizations of Agesen in the Office Action are a hindsight reconstruction of the claimed invention using Applicants' own disclosed subject matter.

Applicants' invention is directed in one aspect (e.g., claims 1 & 5) to a method for a shared memory model system wherein a plurality of threads exist, and a bit that represents a lock type and an identifier for a thread that has acquired a lock in accordance with a first lock type, or an identifier of a second lock type, are stored in the storage area that corresponds to an object, and wherein a lock on an object is thus managed. The method includes: determining, if a second thread attempts to acquire a lock on a specific object that a first thread has accessed, whether a bit that represents the lock type on the specific object represents the first lock type; setting a contention bit if the bit represents the first lock type; determining, before the first thread unlocks the specific object, whether the bit that represents the lock type represents the first lock type; responsive to the determining that the lock type represents the first lock type, storing in the storage area a special identifier that differs from the identifiers for the plurality of threads, the special identifier indicating that a two-stage unlocking is to be performed, wherein only one synchronization command is needed for unlocking when no contention exists; issuing a synchronization command for the memory system; storing in the storage area data indicating the absence of a thread that holds the lock on the specific object; determining whether the contention bit has been set if the bit that represents the lock type represents the first lock type; and terminating an unlocking process if the contention bit has not been set without any other process being performed.

Initially, Applicants note that the Office Action lists the elements of Applicants' claims and then cites various sections of Agesen for allegedly teaching these elements. No explanation as to how the Agesen teachings and suggestions are believed to suggest the recited functionality of Applicants' invention is provided. Based on a careful review of various ones of the citations set forth in the final Office Action for allegedly teaching Applicants' invention, it is submitted

that the Office Action misinterprets various aspects of the teachings of Agesen as somehow being applicable to the claims presented. For example, Applicants' independent claims recite a shared memory model system wherein one identifier is provided for a thread that has acquired a lock in accordance with a first lock type, and a different identifier is provided for thread that has acquired a lock in accordance with a second lock type. Thus, Applicants' claims initially determine if a second thread attempts to acquire a lock on a specific object that a first thread has accessed, whether a bit that represents the lock type on the specific object represents the first lock type. The cited column 15, lines 30-34, 45-49 & 53-64 of Agesen do not appear relevant to this functionality. In fact, two different lock types *per se* do not even appear to be used by Agesen.

Next, Applicants recite setting a contention bit if the bit represents the first lock type. Column 16, lines 40-44, as well as column 16, lines 66 – column 17, line 4 of Agesen are cited for allegedly teaching this aspect of Applicants' process. However, a careful reading of the cited materials fails to uncover any discussion of a contention bit *per se*, let alone the setting of the contention bit if the bit represents the first lock type. These first two steps of Applicants' recited protocol are to enhance lock acquisition, while the remaining portions of claims 1 & 5 facilitate processing of lock release.

For example, the third through the eight elements of Applicants' independent claims 1 & 5 recite, in part, storing in the storage area a special identifier that differs from the identifiers for the plurality of threads. This special identifier indicates that a two-stage unlocking is to be performed, wherein only one synchronization command is needed for unlocking when no contention exists. A careful reading of Agesen fails to uncover any discussion of a special identifier indicative of a two-stage unlocking process, let alone a two-stage unlocking process wherein only one synchronization command is needed for unlocking when no contention exists. In fact, Agesen teaches the opposite. Agesen issues a call to `getMetaLock` and a call to `releaseMetaLock` in acquiring the lock, and issues a call to `getMetaLock` and a call to `releaseMetaLock` in releasing a lock. As shown in Fig. 8, thereof, `getMetaLock` issues an atomic-swap (line 3), and as shown in Fig. 10, `releaseMetaLock` issues a compare-and-swap (line 3). As a result, with Agesen's approach, acquiring and releasing a lock requires four

synchronization commands, even where no contention exists. Thus, the Agesen protocol and Applicants' recited protocol are significantly different.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the obviousness rejection to independent claims 1 & 5.

Further, Applicants respectfully submit that upon a review of the Agesen patent and the art of record, there is no teaching, suggestion or incentive to further modify the processing of Agesen as would be necessary to achieve Applicants' invention.

Yet further, to the extent addressed, the characterizations of the teachings of Agesen provided in the Office Action set forth no technical basis outside that contained in Applicants' own specification for the further modifications necessary to Agesen to achieve their claimed invention. In this aspect, Applicants respectfully submit that the characterizations of the teachings of Agesen in particular merely assert the language of Applicants' claimed invention in hindsight (i.e., with the exception of paragraph 8 at page 5 of the Office Action). Thus, the rejection violates the well-known principle that Applicants' own disclosure cannot be used as a reference against them.

In summary, Applicants respectfully traverse the rejection of independent claims 1 & 5 based on the mischaracterization of the Agesen patent; the lack of an actual teaching, suggestion or incentive in the art for the further modifications necessary to achieve their recited invention; and the use of Applicants' own disclosure and results as a basis for the alleged modifications. There is no discussion in Agesen of various ones of the steps set forth in Applicants' independent claims 1 & 5, and in particular, of the amended language indicating that the special identifier stored in the storage area represents a two-stage unlocking process that is to be performed, wherein only one synchronization command is needed for unlocking when no contention exists.

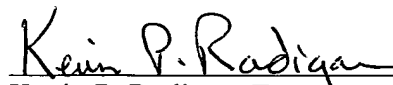
For all the above reasons, Applicants respectfully submit that independent claims 1 & 5 patentably distinguish over the teachings of Agesen. The respective dependent claims are believed allowable for the same reasons noted above with respect to the independent claims, as well as for their own additional characterizations.

Independent claims 11 & 16 are believed allowable for analogous reasons to those noted above in connection with independent claims 1 & 5. For example, each of these claims recites storing in the storage area an identifier that is not related to the representation of the locked state or unlocked state, wherein the identifier indicates that a two-stage unlocking is to be performed, wherein only one synchronization command is needed for unlocking when no contention exists. No analogous processing is believed taught or suggested by Agesen. In fact, Agesen expressly teaches a four-synchronization protocol for performing locking and unlocking.

For all the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection to independent claims 11 & 16, as well as the claims which depend therefrom.

All claims are believed to be in condition for allowance and such action is respectfully requested. Should the Examiner wish to discuss this case further with Applicants' attorney, the Examiner is invited to telephone their below-listed representative.

Respectfully submitted,



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